

morning we found that the leopard had drunk from the pool.

The incident explains how such encounters could become dangerous.

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### 3. CANNIBALISM IN SOUTH INDIAN PALM SQUIRREL *FUNAMBULUS PALMARUM* (LINN.)

#### INTRODUCTION

Rodents, namely rat and squirrels are the most important vertebrate pests that can cause enormous losses to food grains in the field and in storage. They are serious pests of coconut in almost all 76 coconut growing countries in the world including India and its islands. Though they are pests of cultivated crops and stored products, cannibalistic behaviour has been reported among them. Petter (1968) noted cannibalism in rats and mice. Cannibalism has been recorded in five striped squirrel, *Funambulus pennanti* Wroughton (Gupta and Agrawal 1968), captive Indian Gerbil, *Tatera indica indica* Hardwicke (Purohit 1977) and western ghats squirrel, *Funambulus tristriatus* Waterhouse (Bhat 1980). The factors inducing cannibalism in house rat, *Rattus rattus rufescens* Gray was studied by Purohit and Bohra (1973). During an *in vitro* investigation cannibalism was observed in south Indian palm squirrel, *Funambulus palmarum* Linn. at Coconut Research Station, Veppankulam in 1992. As cannibalism has not been reported in south Indian palm squirrel, a separate study was undertaken for confirming cannibalism in this species.

#### MATERIALS AND METHODS

Adult squirrels of *F. palmarum* trapped alive in the coconut plantations were used for the study. The sexes were separated. Two males were put in a netted iron cage (60 x 45 x 30 cm). This was replicated

three times. Likewise two females constituting another pair were allowed in a similar cage and this was also replicated three times. In total six pairs, namely 3 pairs consisting 2 males each and another 3 pairs consisting 2 females each were individually maintained in separate iron cages. These were provided with coconut kernel and bananas.

#### RESULTS AND DISCUSSIONS

Among the six pairs, cannibalism was observed in all the three male pairs within 24 hrs of putting them in the cage. Cannibalism started during night. The head was eaten completely overnight. This was not observed in the females during the experimental period of 14 days. The presence of cannibalism is in conformity with the findings in captive desert gerbil, *Meriones hurrianae* Jerdon (Prakash and Kumbakarni 1962), five striped squirrel, *F. pennanti* (Agrawal 1965; Gupta and Agrawal 1968), Arctic squirrel, *Spermophilus parryii* (Holms 1977) and western ghat squirrel *F. tristriatus* (Bhat 1980).

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[ An obviously aberrant behaviour under *captive* conditions and not to be interpreted as happening in the wild - Editors.]

#### 4. AN APPROACH-BLOCKING DISPLAY BY A FIVE-STRIPED PALM SQUIRREL *FUNAMBULUS PENNANTI* (WROUGHTON) TO A HOUSE CROW *CORVUS SPLENDENS*

(With a text-figure)

Both the five-striped palm squirrel and the house crow are thriving species (Roberts 1977, 1992) but little has been published about their respective behaviour. Therefore, the following observation probably concerns a frequent as well as unstudied behavioural interaction.

On 22 August 1993 I was in Karachi, Pakistan. Towards sunset, I was observing and (through a 500 mm lens) photographing some five-striped palm squirrels wandering on a building of the Sheraton Hotel. A house crow suddenly alighted at some metres from one of these animals (probably out of sight of it) and hopped towards it. The squirrel soon presented the crow with its hind quarters, raising and bristling its tail. The tail was deliberately waved with an approximately lateral motion. The crow had its approach blocked at the distance shown in Fig. 1. The squirrel repeatedly turned its head from side to side but always presented the crow with a caudal image of itself, also when the bird tried a lateral move. The squirrel held the tail raised, waving it intermittently, and held its position until, half a minute later, the crow flew away. Considering the distance of the interacting animals from me (about 40 m) and the tameness of local house crows, I exclude a disturbing effect of my presence. Nor could I detect any other possible interference accounting for what appeared as an attack failure.

This tail movement was similar to tail flagging by the California ground squirrel *Spermophilus*

*beecheyi* (compare, in particular, with Fig. 1 in Hennessy *et al.* 1981), which is primarily used during interactions with snakes. However, California ground

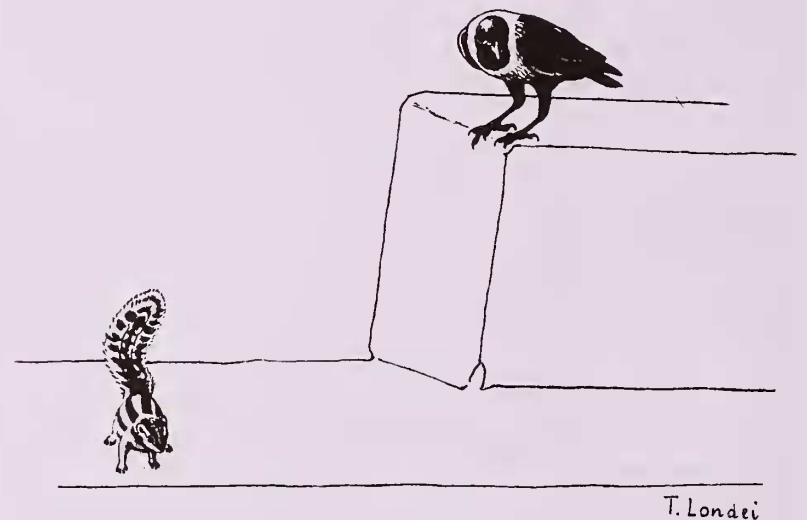


Fig. 1. The observed display.

squirrels usually present the potential predator with a frontal, and not caudal, image while flagging their tails. This difference may be important for both the original and derived functions of the behaviour in question. There are only suggestions that tail flagging may be used to manage the behaviour of the predator (see Hersek and Owings 1993 for an up-to-date review of the various functions of tail flagging). Conversely, the tail movement I observed clearly indicated the crow as a target, not only because of the reactions of the bird, but also because I detected no reaction by the other two or three squirrels that could